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a) Ratio analysis is a quantitative analysis of information contained in a company's financial statements. Financial ratios are a method of measuring performance of a firm and its financial situation. They can be used to analyze trends, make investment decisions and compare a company's financial position against other companies.

- **Efficiency Ratios**-Efficiency ratios is typically used to analyze how well a company uses its assets and liabilities internally.
- **Liquidity Ratios**- Liquidity ratios analyze the ability of a company to pay off its current liabilities. These ratios show the cash levels of a company and the ability to turn other assets into cash to pay off liabilities and other current obligations.
- **Profitability Ratios** - Profitability ratios indicate management's ability to convert sales into profits and cash flow.
- **Solvency Ratios**- Solvency ratios indicate financial stability because they measure a company's debt relative to its assets and equity.

b)

For year 2017 (projected) -

$$\begin{aligned}\text{Current ratio} &= (\text{Current Assets})/(\text{Current Liabilities}) \\ &= (\$2,680,112)/(\$1,039,800) \\ &= 2.5775\end{aligned}$$

$$\begin{aligned}\text{Quick ratio} &= (\text{Current Assets} - \text{Inventory})/(\text{Current Liabilities}) \\ &= (\$963,632)/(\$1,039,800) \\ &= 0.9267\end{aligned}$$

	2015	2016	2017
Current Ratio	2.33	1.4649	2.5775
Quick Ratio	0.848	0.4962	0.9267

The company's liquidity position decreased from 2015 to 2016. This is because the current liabilities shot up from 2015 to 2016 by a huge amount. There was a recorded 175% increase in the current liabilities but only a 73% increase in current assets and a 61% increase in (current assets - inventory), leading to a decline in both the current and quick ratios.

The company's liquidity position is projected to improve in 2017, from 2016. Current assets are projected to increase about 37%, whereas current liabilities are projected to decline by 21%.

Also, quick ratio increases more than the current ratio, because (Current assets - Inventory) increase by 46%, as compared to a 37% increase for all current assets.

No, liquidity ratios are of slightly different interest for each person.

Manager -> Liquidity Ratios are important for a manager because he has to make sure enough cash is available to pay wages, buy raw inputs, inventories. If a company has a lot of liquid assets it will be able to make more cash purchases and less credit purchases, will be able to take care of its accounts payable, etc. Higher liquidity also means that the company will be able to make its own equity investments (without requiring external funding)

Bankers -> Liquidity Ratios are important for Bankers if they are giving short-term loans. But most companies, go for long terms loans for purchase of lands, infrastructure, etc, which last a long time. In that case, it should not matter much if the company taking the loan has a lot of liquid assets. In these cases, solvency would play a more important role. Nevertheless, liquidity risk for banks is a thing paramount importance, as many banks have failed as they could not manage their liquidity risks properly.

Stockholders -> Liquidity ratios are important for stockholders because investors in the business would eventually like to sell their stocks and reap the profits. If a company's assets have poor liquidity, the shareholders will not be able to sell their shares as possible and at the price they had anticipated. (Higher liquidity ratio means company is planning to invest in new ventures, indicated a possible growth of the company, and rising prices of the stock)

c)

For the year 2017 (projected) -

$$\begin{aligned}\text{Inventory Turnover ratio} &= (\text{Cost of goods sold})/(\text{Inventory}) \\ &= (\$5,800,000)/(\$1,716,480) \\ &= 3.379\end{aligned}$$

Industry Average: 6.10

$$\begin{aligned}\text{Days Sales Outstanding} &= 365/(\text{Accounts receivable turnover}) \\ \text{Accounts receivable turnover} &= (\text{Net credit sales})/(\text{Accounts receivable}) \\ &= (\$7,035,600)/(\$878,000) \\ &= 8.013\end{aligned}$$

$$\begin{aligned}\text{Days Sales Outstanding} &= 365/(8.013) \\ &= 45.55 \text{ days}\end{aligned}$$

(It takes ~45 days for the company to collect money from credit purchases)

Industry Average: 32

$$\begin{aligned}\text{Fixed assets turnover} &= (\text{Net sales})/(\text{Average net fixed assets}) \\ &= (\$7,035,600)/(\$836,840) \\ &= 8.407\end{aligned}$$

Industry Average: 7.00

$$\begin{aligned}\text{Total assets turnover} &= (\text{Net sales})/(\text{Total assets}) \\ &= (\$7,035,600)/(\$3,516,952) \\ &= 2.00\end{aligned}$$

Industry Average: 2.50

Although the fixed assets turnover is better than the industry average for manufacturing industries, the total assets turnover is less than the industry average. This could mean two things, either the company is using its assets well (both fixed and current) to generate sales, or the company's plant and equipment is suffering high amounts of depreciation leading to abnormally high values of fixed assets turnover. But since even the total assets turnover is not that low and the accumulated depreciation is only a small percentage of the total assets, it is probably the case that the company is making use of its assets to generate sales, well.

d)

For the year 2009 -

$$\begin{aligned}\text{Debt ratio} &= (\text{Total liabilities})/(\text{Total assets}) \\ &= (\text{Total current liabilities} + \text{Long-term-debts})/(\text{Total assets}) \\ &= (\$1,539,800)/(\$3,516,952) \\ &= 0.437 \text{ (ideally should be less than 0.5)}\end{aligned}$$

Industry Average: .50

$$\begin{aligned}\text{Times-interest-earned} &= (\text{EBIT})/(\text{Interest expense}) \\ &= (\$502,620)/(\$80,000) \\ &= 6.282\end{aligned}$$

Industry Average: 6.20

$$\begin{aligned}\text{EBITDA coverage ratio} &= (\text{EBITDA} + \text{Lease Payments})/(\text{Interest payments} + \text{Lease payments} \\ &\quad + \text{Principal repayments})\end{aligned}$$

$$\text{EBITDA} = (\text{Net income} + \text{Tax} + \text{Interest} + \text{Depreciation} + \text{Amortization}^*)$$

$$\text{EBITDA} = (\$622,640)$$

$$\begin{aligned}\text{EBITDA coverage ratio} &= (\$622,640)/(\$120,000) \\ &= 5.522\end{aligned}$$

Industry Average: 8.00

$$\begin{aligned}
 \text{Financial Leverage} &= (\text{Total assets})/(\text{Shareholders equity}) \\
 &= (\$3,516,952)/(\$1,977,152) \\
 &= 1.778
 \end{aligned}$$

Since the debt ratio is 0.437, it means that the company's liabilities are only 43% of its assets, or that it has more than twice the amount of assets as compared to its liabilities.

The financial leverage of the company is 1.778. This means that the company is using debt and other liabilities to finance its assets. This in a way means that everything else being equal, this company is a more risky investment than a company with lower leverage. But another way to go about it is the Pecking Order Theory, which says that cost of financing increases with asymmetric information. As an investor, due to the asymmetric information that trickles down from the managers to the shareholders, the shareholders are skeptical of them. Hence, it is hard to convince a lot of investors to finance the company as shareholders. On the other hand, it is easier to have one or two lenders finance the capital as a) Cost of debt is lesser than the cost of equity, which reduces the cost of capital for the company, and b) The risk involved with debt financing is lesser than that of equity financing as there is lesser chance of default on debt. Also, when a major proportion of a company's capital is financed by debt, it is seen as a good sign as the company believes that it is undervalued, and has confidence in being able to repay all the debt it has used to finance capital. The interest on debt will also provide tax benefits. At the same time, financing using equity is considered a not so good sign as when more equity shares are issued, the EPS decreases, and the company is perceived to be overvalued.

Since the industry average for Times-Interest-Earned and EBITDA is 6.20 and 8.00, respectively, the company is doing well in terms of paying off its interests and debts, though it is quite close to the industry average.

*Amortization considered to be 0, in this case.

e)

For the year 2017 (projected) -

$$\begin{aligned}
 \text{Profit Margin Ratio} &= (\text{Net income})/(\text{Net sales}) \\
 &= (\$253,584)/(\$7,035,600) \\
 &= 0.036
 \end{aligned}$$

$$\begin{aligned}
 \text{Return on Assets} &= (\text{Net income})/(\text{Total assets}) \\
 &= (\$253,584)/(\$3,516,952) \\
 &= 0.072
 \end{aligned}$$

$$\text{Return on Equity} = (\text{Net income})/(\text{Shareholders equity})$$

$$= (\$253,584)/(\$1,977,152)$$

$$= 0.128$$

--The ROA is the economic profitability of the firm. It has to be analysed to see if the company is creating value for itself. In this case, the ROA is very low, hence, its profitability and assets utilization are low. It could mean that either net income is decreasing or average total assets are increasing, or both. Here the total assets are increasing, which could be a good sign as the company is acquiring more assets. But if it is happening through debt and not its operating profit, then it again is a bad sign.

--ROE is a function of three things:

1. Net profit margin: How a company manages its expenses.
2. Assets utilization
3. How a company is financing its assets(Leverage)

Here, its ROE is low. This means that its net profit margin and assets utilization are not upto the mark. However, a lot of its assets are financed by debt, which is a good thing as debt will provide tax benefits, and increase its EPS.

f)

$$1)\text{Price to Earnings Ratio} = \text{Market Value per Share} / \text{Earnings per Share}$$

$$= 12.17/1.014$$

$$= 12.001$$

The lower the number the better, usually 15-20 is considered good. This ratio for the company signifies that the company is growing, and the investors recognise that as growing value of shares. The company is seen as a profitable investment opportunity.

$$2)\text{Price to cash Flow Ratio} = \text{Share Price} / \text{Cash Flow per Share}$$

$$= 12.17/ 3.45$$

$$= 3.53$$

$$\text{Cash Flow per share} = \text{Operating Cash Flow}/ \text{Number of Shares}$$

$$= 864804/ 250000$$

$$= 3.45$$

$$\text{Operating Cash Flow} = \text{Net income} + \text{depreciation} - \text{delta}(\text{accounts receivable}) - \text{delta}(\text{inventory})$$

$$+ \text{delta}(\text{accounts payable}) + \text{Delta}(\text{Liabilities}) + \text{Delta}(\text{Shareholders Equity})$$

$$= 253584 + (120000) - (878000 - 632160) - (1716480 - 1287360) +$$

$$(359800 - 324000) + (1039800 - 1328960) + (1977172 - 557632)$$

$$= 864804$$

Just like the P/E **ratio**, a value of less than 15 to 20 is generally considered good. Hence the company is a profitable venture for the investors.

$$3) \text{Market to Book Ratio} = \text{Market Value of Firm} / \text{Book value of firm}$$

$$= 12.17/ 7.909$$

=1.538

As the Market to book ratio is over 1, the stock is overvalued. Investors have a negative opinion of the company.

The net operating cash flow of the company is positive. This does not necessarily mean that there is profit. It could also mean that there has been a careful management of the cash inflows and expenditure by the company.

Considering the values of these ratios for this company, the investors are expected to have a positive opinion of the company.

g)

Common-size Analysis (Vertical) -

Balance Sheet -

	2015	2016	2017 (projected)
Cash	0.61%	0.25%	0.39%
Short-term Investments	3.30%	0.69%	2.03%
Accounts Receivable	23.91%	21.89%	24.96%
Inventories	48.69%	44.59%	48.80%
Total Current Assets	76.52%	67.44%	76.20%
Gross Fixed Assets	33.42%	41.67%	34.68%
Accumulated Depreciation	9.95%	9.11%	10.89%
Net Fixed Assets	23.47%	32.55%	23.79%
Total Assets	100%	100%	100%

	2015	2016	2017 (projected)
Accounts Payable	9.91%	11.22%	10.23%

Notes Payable	13.61%	24.94%	8.53%
Accruals	9.25%	9.87%	10.80%
Total Current Liabilities	32.78%	46.03%	29.56%
Long-Term Debt	22.02%	34.64%	14.21%
Common Stock	31.31%	15.93%	47.79%
Retained Earnings	13.87%	3.38%	8.42%
Total Equity	45.19%	19.31%	56.21%
Total Liabilities and Equity	100%	100%	100%

Income Statement -

	2015	2016	2017 (projected)
Sales	100%	100%	100%
Cost of Goods Sold	83.44%	85.35%	82.43%
Other Expenses	9.90%	12.34%	8.71%
Depreciation	0.55%	2.00%	1.70%
Total Operating Costs	93.90%	99.70%	92.85%
EBIT	6.09%	0.29%	7.14%
Interest Expense	1.82%	3.01%	1.13%
EBT	4.27%	-2.71%	6.00%
Taxes (40%)	1.70%	-1.08%	2.40%
Net Income	2.56%	-1.63%	3.60%

Common-size Analysis (Horizontal) -

Balance Sheet -

	2015	2016	2017 (projected)
Cash	100%	80.91%	155.56%
Short-term Investments	100%	41.15%	147.39%
Accounts Receivable	100%	180%	250%
Inventories	100%	180%	240%
Total Current Assets	100%	173.20%	238.44%
Gross Fixed Assets	100%	245%	248.47%
Accumulated Depreciation	100%	180%	262.08%
Net Fixed Assets	100%	271.56%	242.70%
Total Assets	100%	196.53%	239.44%

	2015	2016	2017 (projected)
Accounts Payable	100%	222.52%	247.12%
Notes Payable	100%	360.00%	150%
Accruals	100%	209.53%	279.41%
Total Current Liabilities	100%	275.95%	215.90%
Long-Term Debt	100%	309.18%	154.59%
Common Stock	100%	100%	365.42%
Retained Earnings	100%	47.91%	145.37%
Total Equity	100%	84.01%	297.87%

Total Liabilities and Equity	100%	196.53%	239.44%
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Income Statement -

	2015	2016	2017 (projected)
Sales	100%	170%	205%
Cost of Goods Sold	100%	173.88%	202.51%
Other Expenses	100%	211.76%	180.28%
Depreciation	100%	618.84%	634.92%
Total Operating Costs	100%	180.49%	202.70%
EBIT	100%	8.34%	240.38%
Interest Expense	100%	281.60%	128%
EBT	100%	-208.16%	288.29%
Taxes (40%)	100%	-208.16%	288.29%
Net Income	100%	-208.16%	288.29%

The company's figures of cash, short-term investments, accounts receivable and inventories, all dipped down to lower percentages from 2015 to 2016, indicating that the company's assets became less liquid, but are projected to be restored back to better percentages than 2016, for the year 2017. From 2015 to 2016, there is an increase in the percentages of gross fixed assets, accounts payable, notes payable and long-term debt, which indicates that the company probably brought in new capital in the year 2016, and most of it was brought in on debt rather than equity, which is confirmed by the high financial leverage ratio calculated beforehand. Increase in accounts-payable from '15 to '16, could also indicate that the company is allowing credit purchases to its customers. From 2015 to 2016, there is also a decrease in retained earnings which indicates that the company might've wanted to pay off dividends to the shareholders, leading to a further reduction in total equity.

From the year 2016 to 2017 (projected), cash, short-term investments, accounts receivable and inventories, all have increased again, indicating the company is starting to move towards higher short-term liquidity, confirmed by the rising current and quick ratios as mentioned before in the full-analysis. Increase in current assets as well as accumulated depreciation leads to the same value of fixed assets (no new equipment was brought in, for this year), to appear as a smaller percentage of total assets. Accounts payable, notes payable, long-term debt decreased while common-stock, retained-earnings and total equity increased. The company issued new shares of stock during this year, retained more earnings from shareholders, which led to an increase in the total equity and probably used some of it to pay off their credit purchases (accounts payable), notes payable and some portion of their debt.

From the year 2015 to 2016, net income dipped to less than 0, cost of goods sold increased, other expenses increased and depreciation also increased, indicating a big decline in the profit margin of the company. The EBIT became so less, that the company was unable to pay off its interest expenses and taxes which resulted in a negative net income.

From the year 2016 to 2017, cost of goods sold, other expenses and depreciation (operating expenses), all decrease, leading to a higher EBIT, from which the company is able to pay off its interest expenses and taxes, leading to a net positive income, better than any it has seen from 2015. This is confirmed by a better profit margin ratio as well.

h)

For the year 2009 -

DuPont Equation says that,

Return on Equity = Profit Margin * Total Assets Turnover * Financial Leverage

We have already calculated,

Return on Equity = 0.128

Profit Margin = 0.036 (Weakness)

Total Assets Turnover = 2.00 (Strength)

Financial Leverage = 1.778 (Strength)

Marisetty Industries is selling its products at a very small profit margin (3.6%), indicating that the company is making very less income, but since the total assets turnover ratio is more (2.00), we can conclude that because of larger number of assets turnover cycles, it is able to generate larger amount of sales. The financial leverage ratio is also greater than 1 (1.778), indicating that a large amount of the company's assets are financed through debts instead of shareholder's equity. Although this seems risky, it is a strength for the company because a higher financial leverage ratio indicates a lower cost of capital to the company and its shareholders, as the cost

of debt is lower than the cost of equity. Also, Debt financing is less risky than equity financing as the chances of default are lower, because debt is contractual. Interest on debt also provides tax benefits. The higher financial leverage ratio can also be used to attract shareholders since it promises higher rates of return to the shareholders, as the EPS is high.

i)

- Some firms are very large scale, and operate in multiple sectors of various different industries. For these companies, it is very hard and cumbersome to calculate a coherent set of industry-average ratios.
- In any industry, it is impossible that all firms start functioning together at the same time. There are companies that have been operating for ages, and inflation has the potential of significantly distorting the balance sheet of any company affected. Hence, it is important to have some metric of adjustment to put companies of various ages on the same platform, for an unbiased comparison. If not so, it would be like comparing apples to oranges.
- Seasonal factors can also distort ratio analysis. Hence, it is important to understand the effect of seasonal factors, and make proper adjustments to account for them. For example, umbrellas in the rainy season. A retailer selling umbrellas will have high inventory during this time, and hence his company will have high accounts payable and low return on assets.
- Window dressing refers to actions taken or not taken prior to issuing financial statements in order to improve the appearance of the financial statements. Some companies might indulge in the practice of window dressing to avail a variety of benefits like bonuses to managers, etc. Such practices severely limit the possibility of a proper and meaningful analysis of the company.
- If a company employs different accounting practices, it can alter the comparison to the same company itself, providing incorrect results. (Eg: LIFO and FIFO)
- It is hard to generalise whether a particular company is performing well or not based on a given ratio. In a company that has experienced growth in the past, a high cash ratio may be seen as a good sign, interpreted as a sign that the company is no longer a growth company and be valued lower.
- A company cannot be deemed good or bad just based on ratio calculation. It can show promise in some ratios, while have weak values of other ratios. It is important that the information is used intelligently and the ratios interpreted in a logical manner to reach an insightful conclusion about the company.

j)

1. Are the company's revenues tied to one key customer?

If so, the company's performance may decline drastically if the customer goes elsewhere. This is highly likely in industries where switching costs are low.

2. To what extent are the company's revenues tied to one key product?

Companies that rely on a single product may be more efficient, but lack of diversification increases risk. The threat of substitute products and new entrants in the industry are high for such companies.

3. To what extent does the company rely on a single supplier?

Depending on a single supplier may lead to unanticipated shortages, and thus to lower profits. Also, in such a scenario, the bargaining power of supplier becomes very high, causing the supplier to have a sort-of monopoly.

4. What percentage of the company's business is generated overseas?

Companies which have a large percentage of business overseas are seen to be able to realize higher growth and larger profit margins. However, a large value of their operations depend on the value of the local currency, and the fluctuations in the exchange rates creates added risk. Also, the political stability, tax rates and cost of labour of the country are to be considered.

5. What is the competitive situation?

The competitive rivalry amongst existing firms in the industry, and the competition from new firms that might enter the industry in the future also will also play a role.

6. What are the company's future prospects?

Does the company invest heavily in R&D? Is new product development and product differentiation what separate the company from others? If so, the future prospects of the company will depend heavily on the success of the products currently in the market.

7. How does legal and regulatory environment affect the company?

It is crucial to factor in the effects of proposed regulations and pending or likely lawsuits.

8. Structure of the Board of Directors

Sometimes, the "insiders" of the company have motives to alter the company's performance in the year-end financial reports, which makes the investors skeptical. Hence, the combination of inside and outside directors provides an independent assessment of management's performance, making sure that the interests of shareholders are represented.